UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 6
1445 ROSS AVENUE, SUITE 1200
DALLAS, TX 75202-2733

MAR 24 2008

MEMORANDUM

SUBJECT: Request for a Removal Action at the Cactus Pipe Facility, in Duson, Lafayette Parish, Louisiana

FROM: for Warren Zehner, Senior On-Scene Coordinator J Chris Petersen
Removal Team (6SF-PR)

TO: Samuel Coleman, P.E., Director
Superfund Division (6SF)

THRU: for Ragan Broyles, Associate Director J Chris Petersen
Prevention and Response Branch (6SF-P)

I. PURPOSE

This memorandum requests approval for a time-critical removal action, pursuant to the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), 42 U.S.C. § 9601 et seq., at the Cactus Pipe facility (the "Site") in Duson, Lafayette Parish, Louisiana.

The proposed actions for the Site involve the removal, consolidation, transportation, and the off-site disposal of the Site soils and debris that are contaminated with lead and various naturally occurring radioactive material (NORM) isotopes, and approximately 150 deteriorating containers of varying sizes containing hazardous wastes and/or residual wastes from the oil production tubular refurbishing process that took place on the facility. The removal action will be performed at areas within the Site where the lead, NORM or containerized wastes may present an imminent and substantial endangerment to the public health or welfare or the environment.

As described in Section III of this memorandum, the factors described in Section 300.415 of the National Contingency Plan (NCP), 40 CFR § 300.415, have been considered, and, based on those factors, a determination has been made that a removal action at the Site is appropriate. This Removal Action is not expected to exceed the statutory twelve-month time limit, nor is it expected to exceed the statutory $2,000,000 cost ceiling.

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Webster	Broyles/Petersen	Bradsher	Johnson	Moran	Peycke	Coleman
6SF-PR	6SF-P	6SF-TE	6SF-T	6RC-S	6RC-S	6SF
3/20/08	for 1/28/08	2/14/08	for 3/20/08	3/20/08		

II. SITE CONDITIONS AND BACKGROUND

CERCLIS ID: LA0000605278
Category of Removal: Time Critical
Site ID: 06JQ
Latitude: 32.13'07" N
Longitude: -92.08'28" W

A. Site Description

1. Removal Site Evaluation

In July 2003, the Environmental Protection Agency, Region 6 Prevention and Response Branch (EPA PRB) received a request for assistance in the evaluation of this Site for potential removal action from the State of Louisiana Department of Environmental Quality (LDEQ) (See Attachment 2). Documentation provided by the LDEQ indicated that the Site was a bankrupt oil production tubular refurbishing facility that was contaminated with NORM, lead, and other potentially hazardous drummed wastes present on the facility. Based on this information, the Superfund Technical and Response Team (START) II contractors were tasked by EPA PRB to conduct a Site Assessment and Data Review on the Site.

The principal contaminants associated with this Site are elevated concentrations of lead and NORM isotopes, principally Radium 226, disbursed throughout the surface and near surface soils and debris present on the Site. The elevated concentrations of lead and NORM appear to be the direct result of the oil production tubular refurbishing processes that occurred during the operation of the facility.

2. Physical Location

The Cactus Pipe facility is a 13.76 acre parcel of land located on South Fieldspan Road (Louisiana Highway 724), approximately 1.5 miles south of Duson, Lafayette Parish, Louisiana. The facility is located in a semi-rural area. Residential and livestock grazing properties abut the Site on the north, and live stock grazing properties form the eastern boundary. Fieldspan Road and agricultural property abut the Site on the western boundary, and a commercial property bounds the Site on the south (See Attachment 3).

The entire site is heavily overgrown with vegetation, and composed primarily of open land which was used for the storage of oil field tubular inventory (approximately the eastern two-thirds of the site). There are six dilapidated and/or partial structures and the remnants of at least three other structures present in the historic processing area (approximately the western one-third) on the Site. Three drainage ditches are located on the Site, two that bisect the facility

north and south and one along the northern boundary. The two ditches that run north and south reportedly delineated the tubular storage area. It appears that these ditches were designed to carry surface water from the tubular storage area to the ditch on the north boundary and then off-site to the Coulee Ile des Cannes, which is a tributary of the Vermilion River (See Attachment 4).

The perimeter of the Site is fenced by a dilapidated and heavily corroded chain link fence on the western boundary and dilapidated barbed wire on the remaining boundaries. Due to the extremely overgrown nature of the Site, it was impossible to tell if there was any evidence of trespass or other unauthorized activities occurring on the Site.

3. Site Characteristics

The EPA is still investigating the operational history of the Site; nonetheless, the following information is a fairly accurate historical description of Site operations based on discussion with State and local government personnel. According to historical information obtained from LDEQ and/or the Lafayette Parish Consolidated Government records, Cactus Pipe and Supply (CPS) began operations as a LDEQ licensed NORM pipe yard (LDEQ RPD General License LA-0071-N01) in 1971. Reported site operations included the descaling, cleaning, threading, storage and resale of tubulars used in oil field production. In 1980, GEO International (GEO) merged with CPS. In 1992 CPS changed its name to GEO Pipe Company (GPC). The facility ceased operations in 1994 when GPC filed a Chapter 11 bankruptcy petition in the United States Bankruptcy Court for the Northern District of Illinois, Eastern Division. On May 15, 1995, GPC petitioned to abandon the facility as part of the bankruptcy proceedings. Prior to receiving approval from the Court to abandon the facility, GPC entered into a settlement agreement with LDEQ on or about August 22, 1995, in response to LDEQ Compliance Order HE-C-95-0207. As part of the settlement agreement GPC gave LDEQ $125,000 toward the remediation of the facility and LDEQ terminated its action to contest the abandonment of the facility under the bankruptcy proceedings. LDEQ has agreed to make the settlement money available to EPA for this proposed removal action. (See Enforcement Addendum for additional information)

Little is known about the specific processes conducted at the Site. However, it appears based on evidence present on the Site and historic diagrams from LDEQ files that the layout and the processes are consistent with existing oil production tubular refurbishing operations throughout the oil industry in the United States. In general, these types of facilities perform two functions in the oil industry, refurbishing tubulars after the completion of an oil/gas well drilling or production operation and the storage of tubulars after refurbishing prior to oil/gas well drilling or production operations commencing. These facilities buy and sell tubulars or provide services for oil companies through leasing arrangements.

During the refurbishing process, tubulars from drilling or other production related processes are brought into a facility where they are descaled, cleaned, repaired and otherwise refurbished. The NORM and lead contamination on site are believed to have been derived from these processes. NORM is a very common constituent in oil field produced water in south Louisiana. Typically a scale layer of NORM deposits develop on production tubulars that are in contact with the produced water for a length of time (ie. production tank battery) (See Attachment 5, USGS NORM fact sheet, FS-142-99, September 1999, for additional information). As aforementioned, this scale layer is removed or reduced during the refurbishing process thus generating a NORM waste stream on the Site. It appears that this waste stream may have been poorly managed, resulting in the current NORM contamination on the Site. Lead is a common constituent in many pipe dopes, sealers, and solders associated with oil field tubulars. It appears that the lead present on site resulted from the poor handling of the lead containing refurbishment wastes and residues.

Based on LDEQ and START-II site assessment data, there are approximately 1,800 cubic yards of NORM contaminated soil/debris with radioactivity levels up to 43,891 counts per second (cps). This level is approximately 54 times the background radioactivity level of 800 cps. While several radioactive isotopes make up the NORM contamination in the cubic yards of soil/debris on the Site, Radium 226 is the isotope of principal interest. Analytical results indicate that Radium 226 is present on the Site in concentrations up to 1,287.5 pico Curies per gram (pCi/g). Approximately 2,500 cubic yards of lead contaminated soil/debris are also present on the facility with lead levels up 30,496 parts per million (ppm). In addition to the 4,300 cubic yards of NORM and lead contaminated soil/debris there are approximately 150 containers of varying sizes and chemical compositions located in an existing storage building and/or an exposed disposal area along the southeastern boundary of the Site. Several of the containers in the exposed disposal area have marking labels indicating that the container is RCRA hazardous when empty and at least two containers meet the RCRA hazardous waste characteristic of corrosivity as defined in 40 CFR § 261.22. All of the contamination on this Site appears to be derived and directly related to the historic oil production tubular refurbishment operations that occurred on the facility during its active operation.

4. Release or threatened release into the environment of a hazardous substance, pollutant or contaminant

The principal contaminants of concern on this Site are NORM and lead present in 4,300 cubic yards of soil on the Site. Some or all of the wastes identified above are hazardous substances within the meaning of Section 101(14) of CERCLA, 42 U.S.C. § 9601(14). The EPA has identified the corrosive containerized wastes and the NORM and/or lead contaminated soil/debris as the primary contaminants of concern at the site.

As previously stated, the primary contaminants of concern at the Site are the NORM and

lead contaminated soil/debris derived from the oil field tubular refurbishing processes conducted on the Site during its operational history. Radium 226 and lead are hazardous substances as defined in Section 101(14) of CERCLA, 42 U.S.C. § 9601(14) and 40 CFR § 302.4. The following are the known health effects associated with exposure to the aforementioned hazardous substances on the Site.

Radium 226

Radium 226 is principally a source of alpha and gamma radiation, although some beta radiation is also produced during the decay process. According to the Agency for Toxic Substance and Disease Registry (ATSDR) document "ToxFAQs for Radium" (July 1999), exposure to radium can cause adverse effects to the eyes (cataracts) and blood (anemia). Radium has been identified by the EPA and the National Academy of Sciences as a known human carcinogen, being specifically linked to cancers of the bone, breast and leukemia.

Lead

According to the U.S. Department of Health and Human Services (Centers for Disease Control and Prevention (CDC) document "Preventing Lead Poisoning in Children,@ October 1991; and the Agency for Toxic Substance and Disease Registry (ATSDR) document "Toxicological Profile for Lead," (April 1993), the following health effects are associated with exposure to lead:

Exposure to lead is particularly dangerous to unborn and young children. Both ingestion and inhalation can be a means for lead assimilation in humans. Lead can affect virtually every system in the body. Lead is particularly harmful to the developing brain and nervous system of fetuses and young children. Unborn children can be exposed to lead through their mothers. This may cause premature births, smaller babies, and decreased mental ability in the infant. Severe lead exposures in children can cause coma, convulsions, and even death. Lower levels of lead exposure can cause adverse effects on the central nervous system, kidney, and hematopoietic system. Blood lead levels as low as 10 ug/dL, which would not cause distinctive symptoms, are associated with decreased intelligence and impaired neuro-behavioral development. Many other effects begin at low levels including decreased stature or growth, decreased hearing acuity, and decreased ability to maintain a steady posture.

In adults, lead exposure may decrease reaction time and possibly affect the memory. Lead exposure may also cause weakness in fingers, wrists, or ankles. Lead exposure may cause high blood pressure, anemia, brain and kidney damage, abortions, and damage to the male reproductive system.

Exposure pathways are the routes that a contaminant can take in order to be assimilated

by a human or animal. For example, incidental ingestion of contaminated soils through direct contact or the inhalation of contaminated airborne particles (dust) are both exposure pathways. The exposure pathways of concern at the Site are described below:

- A significant amount of the surface area of this Site is contaminated with elevated concentrations of NORM and lead at or near the surface. The contaminated soils are fine grained and have a high probability of adherence to skin, clothing and fur as a result of direct contact. For humans, incidental ingestion of the contaminants adhering to skin or clothing can occur through normal hand-to-mouth activities such as play or mealtime.

- Inhalation is another exposure pathway at this Site. As discussed above a significant amount of the surface soils on this Site are contaminated with lead and NORM. Since the soil is fine grained it is easily airborne after disturbance and subject to inhalation by humans or livestock in the area.

5. NPL Status

This Site is not presently on the NPL. However, should the Site rank on the NPL, the current removal action will be consistent with any subsequent remedial activities that might be taken due to the fact that the proposed actions constitutes a source control measure.

6. Maps, pictures and other graphic presentations

Attachment 1 - Enforcement Addendum (Enforcement Confidential/FOIA Exempt)
Attachment 2 - LDEQ Referral Letter
Attachment 3 - Figure 3-1 - Site Location Map
Attachment 4 - Figure 3-3 - Site Sketch
Attachment 5 - USGS NORM Fact Sheet
Attachment 6 - Site Photographs

B. Other Actions to Date

1. Previous actions

As referenced above, the LDEQ requested that the PRB assess the conditions on this Site in July 2003. After notification, the EPA Region 6 On-Scene Coordinator (OSC) tasked the Region 6 Superfund Technical and Response Team (START) II contractor to review existing data from the Site collected by the LDEQ to fully characterize the actual and/or potential threats posed by this Site.

2. Current Actions

At the request of the LDEQ, the EPA collected several representative samples for analysis utilizing the synthetic precipitation leaching procedure (SPLP) as outlined in the LDEQ RECAP regulations in October 2007. This operation was done to verify that RECAP standards could be met for the proposed action and cleanup levels as discussed in Section V(1)(a) below. Results from the SPLP analysis confirmed that the proposed action and cleanup levels could be attained. The EPA has not conducted any new Site activities since the completion of the SPLP sampling in October 2007.

C. State and Local Authorities' Roles

1. State and local actions to date

The State of Louisiana, through the LDEQ, has been involved in the previous and current activities conducted at the Site. EPA has coordinated all site assessment activities with LDEQ.

2. Potential for continued State/local response

Neither the LDEQ nor the City/Parish Consolidated Government of Lafayette will be able to provide a response action to physically address the NORM and/or lead contaminated soil/debris or the corrosive containerized wastes present at the Site. However, the LDEQ has agreed to a financial contribution to the removal through a State removal contract with EPA.

III. THREAT TO PUBLIC HEALTH OR WELFARE OR THE ENVIRONMENT

A. Threats to Public Health

The factors described in Section 300.415 of the National Contingency Plan (NCP), 40 CFR § 300.415, have been considered, and, based on those factors, a determination has been made that a removal action is appropriate to address the hazardous substances present in various containers and soil/debris at the Site. Any or all of these factors may be present at a site yet any one of these factors may determine the appropriateness of a removal action.

1. Actual or potential exposure to nearby human populations, animals, or the food chain from hazardous substances or pollutants or contaminants. 40 CFR § 300.415(b)(2)(i)

As discussed above, the Site is located in a semi-rural area of Lafayette Parish and is bordered on two sides by residential and light industrial properties. Significant quantities of

NORM and/or lead contaminated soils are found throughout a large portion of the Site. These conditions pose a high potential for exposure to any human or animals which may trespass or enter the Site.

2. Actual or potential contamination of drinking water supplies. 40 CFR § 300.415(b)(2)(ii).

There are no drinking water supplies in close proximity to known Site contamination. Groundwater in the vicinity of the Site is not used as drinking water. Residents near the facility are on public water distribution systems; therefore, the actual or potential contamination of drinking water is unlikely.

3. Hazardous substances or pollutants or contaminants in drums, barrels, tanks, or other bulk storage containers, that may pose a threat of release. 40 CFR § 300.415(b)(2)(iii).

As discussed above, there are approximately 150 containers of varying sizes and chemical compositions located in an existing storage building and/or an exposed disposal area along the southeastern boundary of the Site. Several of the containers in the exposed disposal area have marking labels indicating that the container is RCRA hazardous when empty and at least two containers meet the RCRA hazardous waste characteristic of corrosivity as defined in 40 CFR § 261.22. All of the exposed drums show significant signs of corrosion due to exposure to the elements, and several of these containers have no lids and are open to the atmosphere.

4. High levels of hazardous substances or pollutants or contaminants in soils largely at or near the surface that may migrate. 40 CFR § 300.415(b)(2)(iv).

As discussed above, results from the Site Assessment indicate high levels of NORM and lead contamination in the surface and near surface soils (< 12 inches) on a significant portion the facility.

5. Weather conditions that may cause hazardous substances or pollutants or contaminants to migrate or be released. 40 CFR § 300.415(b)(2)(v).

As referenced above, the Site is located in south-central Louisiana. This part of the State routinely experiences tropical storms and hurricanes of varying degrees of intensity during the Summer and Fall. Since the referenced contamination is located at or near the surface of the facility, there is a high potential for subsequent off-site migration of hazardous substances from the Site via the heavy flooding rains or strong winds that are associated with tropical low pressure systems.

6. Threat of fire or explosion. 40 CFR § 300.415(b)(2)(vi).

There are no fire or explosion hazards related to the hazardous substances that are being addressed through this response action.

7. The availability of other appropriate federal or state response mechanisms to respond to the release. 40 CFR § 300.415 (b)(2)(vii).

At this time, there are no other mechanisms available to respond to the hazardous substances present on the Site in a timely manner so as to effectively reduce the imminent and substantial endangerment to public health posed by the hazardous substances located on the Site. The State and local officials do not have the resources available to address the current dangerous conditions at the Site. If other mechanisms become available during the conduct of this response action, the EPA will evaluate those mechanisms as appropriate.

8. Other situations or factors that may pose threats to public health or welfare of the United States or the environment. 40 CFR § 300.415(b)(2)(viii).

There are trip/fall and other physical hazards to trespassers who may enter the Site through the dilapidated fencing on the perimeter of the Site. These trip/fall hazards increase the likelihood that humans may come into direct contact with the hazardous substances present on the facility.

B. Threats to the Environment

The proposed action to be taken during this response is designed solely to address a public health threat resulting from the hazardous substances present on the Site from the historic oil production tubular refurbishing process. However, these actions, although not specifically designed to do so, will significantly reduce or mitigate any potential ecological threats.

IV. ENDANGERMENT DETERMINATION

Actual or threatened releases of hazardous substances, pollutants or contaminants from the Site, if not addressed by implementing the response action selected in this Action Memorandum, will continue to present an imminent and substantial endangerment to public health or welfare or the environment.

V. PROPOSED ACTIONS AND ESTIMATED COSTS

Proposed Actions

The proposed response action will address threats at the Cactus Pipe Facility.

1. Proposed action description

a. Action levels and clean-up levels

EPA uses the term "action level" to mean the contaminant concentration level in soil or groundwater at which a response action in question will be taken. Wastes that meet the definition of a hazardous waste under RCRA statutes not in a soil or groundwater matrix (ie. the drummed wastes on the Site) are usually not subject to a specific action level. They are simply removed to prevent actual or potential exposures. Action levels should not be confused with "cleanup levels." The cleanup level is the contaminant concentration level which the response action is designed to meet. That is, once EPA has identified a contaminated medium which contains concentrations of a contaminant which exceed the action level, the removal action calls for continued response until the concentration of the contaminant in the contaminated medium are below the established cleanup level. For this removal action, both the action level and cleanup level for Radium 226 (the principal NORM constituent) is 30 pCi/g and 1400 ppm for lead in the contaminated soils.

In developing the action levels and cleanup levels for the Site, the EPA considered the Louisiana RECAP regulations, Louisiana Administrative Code (LAC) 33 I Chapter 33 for lead and the Louisiana NORM regulations, LAC 33 XV Chapter 14 for Radium 226, to determine whether they were Applicable or Relevant and Appropriate Requirements (ARARs) within the meaning of CERCLA Section 121, 42 U.S.C. § 9621. After the action levels and cleanup levels for lead and Radium 226 in soil were reviewed and found to be consistent with historic action levels and cleanup levels used by the PRB on similar sites, the OSC decided to utilize the aforementioned RECAP and NORM regulations as the action levels and cleanup levels for the lead and Radium 226 contamination in the soils on this Site

b. Certain contaminated materials will be taken off-site

The contaminated soils, generated during the removal action will be excavated, consolidated and taken off-site for disposal. The contamination found at the Site and discussed in this memorandum is from the historic oil field tubular refurbishing operations. The contaminated soils described above are a solid waste, but do not meet the definition of a hazardous waste under RCRA regulations. NORM wastes derived from oil production are solid waste within the meaning of 40 CFR § 261.4 (B)(5), but are excluded as hazardous waste under

RCRA. Further, analytical data from the Site indicate that the lead contamination does not meet the criteria of a hazardous waste within the meaning of 40 CFR § 261.24. Since the aforementioned materials are not a hazardous waste under RCRA, EPA does not consider the RCRA hazardous waste management requirements to be applicable, relevant or appropriate (See Section V 4(c) below). Although these wastes are not considered hazardous wastes under RCRA regulations, they are determined to be CERCLA hazardous substances.

All hazardous substances, pollutants or contaminants (hereinafter hazardous substances, pollutants or contaminants are referred to as CERCLA wastes) removed off-site for treatment, storage, or disposal shall be treated, stored, or disposed of at a facility in compliance, as determined by EPA, pursuant to CERCLA Section 121(d)(3), 42 U.S.C. section 9621(d)(3), and the following rule: "Amendment to the National Oil and Hazardous Substances Pollution Contingency Plan; Procedures for Planning and Implementing Off-Site Response Action:. Final Rule." 58 Fed. Reg. 49200 (September 22, 1993); codified at 40 CFR § 300.440.

RCRA hazardous drums will be managed in accordance with the RCRA implementing regulations. Although, the soil/debris wastes generated during this removal are exempt from RCRA hazardous waste regulations for the reasons discussed above, it is useful in the Site-specific situation for EPA to use certain RCRA requirements to control and track waste sent off-site. Accordingly, RCRA waste analysis requirements found at 40 CFR §§ 261.20 and 261.30, RCRA manifesting requirements found at 40 CFR § 262.20, and RCRA packaging and labeling requirements found at 40 CFR § 262.30 will be utilized for off-site disposal of contaminated materials (CERCLA wastes) generated during this removal action. Because on-site storage of repackaged hazardous wastes is not expected to exceed ninety (90) days, specific storage requirements found at 40 CFR Part 265 are neither applicable nor relevant nor appropriate. (See 40 CFR § 262.34). All containers of wastes, to be sent off-site for disposal, will be packaged, labeled, and properly manifested in accordance with appropriate requirements for this removal.

All off-site transportation of CERCLA wastes will be performed in conformance with RCRA and U.S. Department of Transportation (DOT) requirements. See generally 40 CFR Part 263.

c. Cactus Pipe Site

In order to meet the goals of the removal action discussed below, all of the contaminated soil/debris above the action/cleanup levels and the containerized waste materials found at the Site must be removed.

The goal for the Site under this action memorandum is to totally remove or greatly reduce actual or potential exposure to the hazardous substances and/or wastes in its various forms on the Site through removal and consolidation or excavation.

Removal and Consolidation: All of the corrosive and other containerized wastes present on the Site will be bulked by chemical compatibility and consolidated, where possible, into containers for off-site disposal. All of the wastes generated during this phase of the removal action will be sent to an appropriate off-site disposal facility that is acceptable under the Off-site Rule, 40 CFR § 300.440.

Excavation: All soil with NORM and/or lead levels which exceed action levels stated above will be excavated. Sample results from the Site Assessment indicate that the contamination should not exceed a maximum depth of 12 inches below the surface. After excavation has been completed, confirmatory samples will be taken for laboratory analysis of Radium 226 and/or lead to insure that the aforementioned clean-up level has been reached, with the exception of a 50 foot wide buffer strip abutting the residential properties along the northwest boundary of the Site. At the request of the LDEQ, residential clean-up standards of 15 pCi/g for Radium 226 and 400 ppm for lead will be used within the buffer area. The sampling and analytical activities to be conducted during this project will be defined in the Quality Assurance Sampling Plan (QASP) designed for this removal. The contaminated soils/debris removed from the Site will be consolidated in a secure, central on-site area for loading and transport to an off-site disposal facility that is acceptable under the Off-site Rule, 40 CFR § 300.440.

After completion of the excavation, the removed contaminated soil/debris will be replaced with clean fill, where appropriate, and the property will be restored to its original contour gradient to the extent practicable.

d. Off-Site Disposal

The off-site disposal of the RCRA hazardous wastes (containerized corrosives), and the CERCLA wastes generated from this removal will be in conformance with EPA's procedures for planning and implementing off-site response action, 40 CFR § 300.440. All off-site transportation of hazardous waste will be performed in conformance with applicable U.S. Department of Transportation (USDOT) requirements. Other requirements under the Occupational Safety and Health Act (OSHA) of 1970, 29 U.S.C. § 651 et. seq., and under the laws of States with plans approved under section 18 of the State's OSHA laws, as well as other applicable safety and health requirements, will be followed. Federal OSHA requirements include, among other things, Hazardous Materials Operation, 29 CFR Part 1910.120, as amended by 54 Fed. Reg. 9317 (March 5, 1989), all OSHA General Industry (29 CFR Part 1910) and Construction (29 CFR Part 1926) standards wherever they are relevant, as well as OSHA recordkeeping and reporting regulations, the EPA regulations set forth in 40 CFR Part 300, and other EPA policies/guidelines relating to the conduct of work at Superfund sites.

2. Contribution to Remedial Performance

The actions described above for this Site will contribute to any presumed remedial cleanup alternative since the response action constitutes contaminant source removal.

3. Description of Alternative Technologies

At this time, there are no other proven alternative technologies that could feasibly be applied at this Site. The only appropriate action is to immediately begin the response action as describe in this memorandum. If an equally protective and less expensive technology is later identified, it may be considered.

4. Applicable or Relevant and Appropriate Requirements (ARARs)

The proposed removal action will be conducted to eliminate the actual or potential exposure to hazardous substances pursuant to CERCLA, in a manner consistent with the NCP, as required at 33 U.S.C. § 1321(c)(2) and 42 U.S.C. § 9605. As per 40 CFR Section 300.415(j), Superfund-financed removal actions under CERCLA § 104 and § 106 shall, to the extent practicable considering the exigencies of the situation, attain the applicable or relevant and appropriate requirements (ARARs) under Federal environmental law. The following is an analysis of ARARs for this action:

a. Chemical-specific ARARs - As discussed above, EPA reviewed the Louisiana RECAP regulations, found at LAC 33 I Chapter 33, in developing the proposed action level and cleanup levels for the Radium 226 and lead contamination present in the soils on the Site.

b. Location-specific ARARs - No location specific ARARs were identified for this Site.

c. Action-specific ARARs – All of the containerized wastes that are identified as a hazardous waste under the RCRA and will be managed as such.

Although, the soil/debris wastes generated during this removal are exempt from RCRA hazardous waste regulations for the reasons discussed above, it is useful in the Site-specific situation for EPA to use certain RCRA requirements to control and track the wastes sent off-site. Accordingly, RCRA waste analysis requirements found at 40 CFR §§ 261.20 and 261.30, RCRA manifesting requirements found at 40 CFR § 262.20, and RCRA packaging and labeling requirements found at 40 CFR § 262.30 will be utilized for off-site disposal of contaminated materials (CERCLA wastes) generated during this removal action. Because on-site storage of repackaged hazardous wastes is not expected to exceed ninety (90) days, specific storage requirements found at 40 CFR Part 265 are neither applicable nor relevant nor appropriate. See 40 CFR § 262.34. All containers of wastes, to be sent off-site for disposal will be packaged,

labeled, and properly manifested in accordance with appropriate requirements for this removal.

5. Project schedule

The proposed actions for this time critical removal are expected to be initiated within two weeks of approval of this action memorandum. Total duration of the removal action is estimated at twelve weeks.

B. Estimated Costs

Extramural Costs

Removal Contractors	$ 1,566,000
START III	$ 90,000
Subtotal, Extramural Costs	$ 1,656,000
Extramural Costs Contingency (20%)	$ 331,200
TOTAL, EXTRAMURAL COSTS	**$ 1,987,200**

VI. EXPECTED CHANGE IN THE SITUATION SHOULD NO ACTION BE TAKEN OR ACTION BE DELAYED

Should the actions described in this Action Memorandum be delayed or not taken, the elevated concentrations of lead and NORM present on the Site will continue to pose a significant threat of off-site migration and exposure to the residents and businesses abutting the property.

VII. OUTSTANDING POLICY ISSUES

There are no outstanding policy issues associated with this removal action.

VIII. ENFORCEMENT

For administrative purposes, information concerning confidential enforcement strategy for this Site is contained in the Enforcement Confidential Attachment #1. The total for this removal action based on full-cost accounting practices that will be eligible for cost recovery are estimated to be $2,938,987.

(Direct Cost) + (Other Direct) + (40.81% of Total Direct {Indirect Cost}) =
Estimated EPA Cost for a Removal Action

$1,987,200 + $100,000 + (40.81% x $2,087,200) = $2,938,987

Direct costs include direct extramural costs and direct intramural costs. Indirect costs are calculated based on an estimated indirect cost rate expressed as a percentage of site-specific direct costs, consistent with the full cost accounting methodology effective October 2, 2002. These estimates do not include pre-judgment interest, do not take into account other enforcement costs, including Department of Justice costs, and may be adjusted during the course of a removal action. The estimates are for illustrative purposes only, and their use is not intended to create any rights for responsible parties. Neither the lack of a total cost estimate nor the deviation of actual total costs from this estimate will affect the United States' right to cost recovery.

IX. RECOMMENDATION

This decision document represents the selected removal action for the Cactus Pipe Site, near Duson, Lafayette Parish, Louisiana, and is developed in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), 42 U.S.C. § 9601 et seq., and is not inconsistent with the National Contingency Plan (NCP), 40 CFR Part 300. This decision is based on the administrative record for the Site.

Conditions at the Site meet the NCP Section 300.415 (b) (2), 40 CFR § 300.415 (b) (2), criteria for a removal. I recommend your approval of the proposed removal action request. The total estimated EPA cost for the removal is $2,938,987. Of this, an estimated $1,987,200 comes from regional funds.

APPROVED: Pam Phillips, Acting DATE: 3/24/08

ATTACHMENT 1

ENFORCEMENT ATTACHMENT TO THE ACTION MEMORANDUM FOR the "CACTUS PIPE FACILITY SITE," IS ENFORCEMENT SENSITIVE

Note: **This document has been withheld as Enforcement Confidential and is located in Separate "CONFIDENTIALITY FILING" at U.S. EPA, Region 6**

ATTACHMENT 2

Cactus Pipe Facility Site

Louisiana Department of Environmental Quality (LDEQ) Referral Letter

State of Louisiana

Department of Environmental Quality

M. J. "MIKE" FOSTER, JR.
GOVERNOR

L. HALL BOHLINGER
SECRETARY

July 9, 2003

CERTIFIED – RETURN RECEIPT REQUESTED (7000 1670 0013 6797 8802)

Mr. Charlie Gazda, Chief
Response and Prevention Branch
U.S. Environmental Protection Agency
1445 Ross Avenue; Suite 1200
Dallas, Texas 75202-2733

2003 JUL 24 PM 3:48
RESPONSE AND PREVENTION BRANCH

RE: Transfer to the Environmental Protection Agency Response and Prevention Branch
Cactus Pipe Incorporated Site; AI# 44077
HWY 724, Adjacent to 1217 South Fieldspan
Duson, Louisiana; Lafayette Parish

Dear Mr. Gazda:

The purpose of this letter is to formally request that EPA consider Comprehensive Environmental Response Compensation Liability Act (CERCLA) action for the above-referenced Agency Interest (AI# 44077)/Area of Investigation (AOI) in Lafayette Parish, Louisiana. We feel that such action may be needed due to the site containing NORM mixed waste, as well as a recent residential development in the immediate area of the site. A copy of an EPA led Preliminary Assessment Report (PAR) is included as an attachment to this letter, along with the Louisiana State Site Assessment Phase I, for your review and consideration.

The Louisiana Department of Environmental Quality (LDEQ) is requesting EPA assistance because existing resources may not facilitate a timely response action. The bankruptcy settlement in the amount of ($125,000) may not cover the complete remedial action.

If you have any questions regarding this investigation, please contact Ms. Regina A. Philson at (225) 219-3236. All future correspondence regarding this matter should be submitted in triplicate and directed to:

Keith L. Casanova, Administrator
Remediation Services Division
P.O. Box 4314
Baton Rouge, LA 70821-4314

One of the copies should be directed to the attention of Ms. Regina A. Philson. Please include the Agency Interest (AI) number referenced above on all correspondence. Thank you for your cooperation.

Sincerely,

Keith L. Casanova

Keith L. Casanova, Administrator
Remediation Services Division

/rap

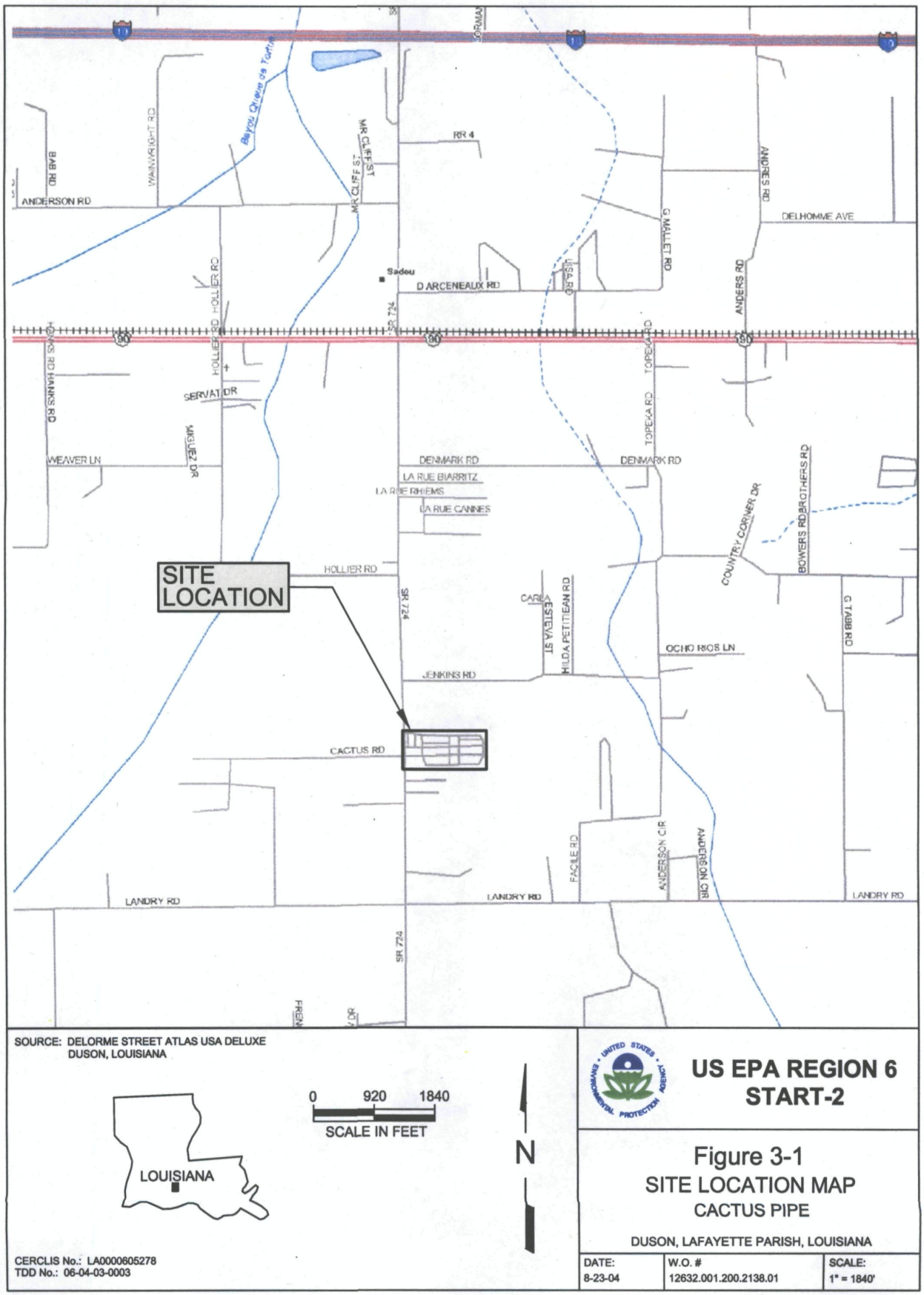
Attachments

c: Ms. Terri Gibson, Remediation Support
LDEQ File Scanning Room 1400 - IAS

ATTACHMENT 3

Cactus Pipe Facility Site

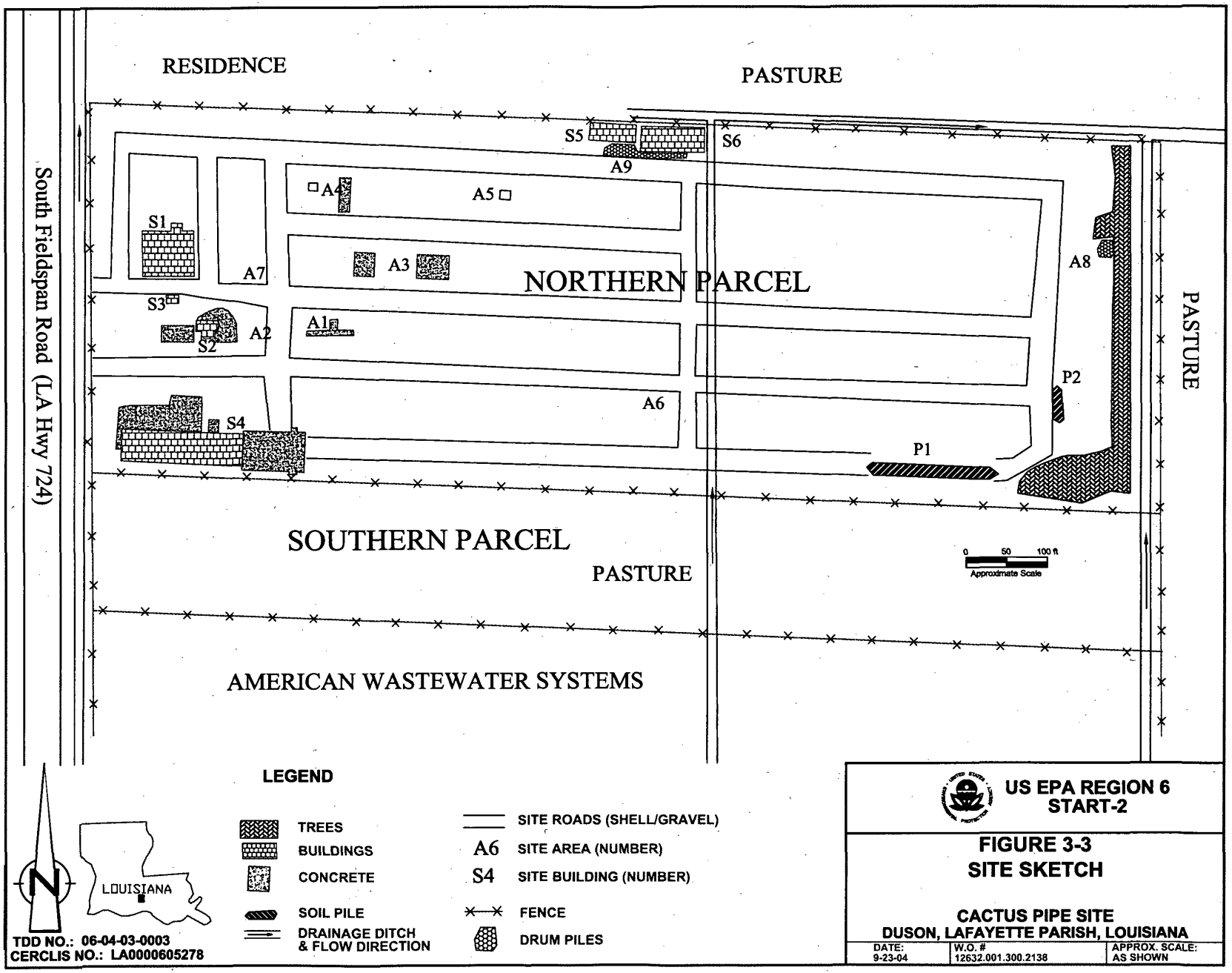
Figure 3-1
Site Location Map


SITE LOCATION
ANDERSON RD
BAB RD
WAINWRIGHT RD
Bayou Chicken de Turtle
MR CLIFF ST
RR 4
ANDERS RD
DELHOMME AVE
G MILLET RD
Sadou
D ARCENEAUX RD
USA RD
HOLLIER RD
SR 724
HANNS RD
SERVAT DR
WEAVER LN
WEAVER DR
DENMARK RD
LA RUE BIARRITZ
LA RUE RHEIMS
LA RUE CANNES
TOPEKA RD
COUNTRY CORNER DR
BOWERS RD
BROTHERS RD
CARLA ST
HILDA PETITEAN RD
OCHO RIOS LN
JENKINS RD
G TABB RD
CACTUS RD
FACILE RD
ANDERSON CIR
ANDERSON DR
LANDRY RD
SOURCE: DELORME STREET ATLAS USA DELUXE
DUSON, LOUISIANA
LOUISIANA
0 920 1840
SCALE IN FEET
N
US EPA REGION 6
START-2
Figure 3-1
SITE LOCATION MAP
CACTUS PIPE
DUSON, LAFAYETTE PARISH, LOUISIANA
DATE: 8-23-04
W.O. # 12632.001.200.2138.01
SCALE: 1" = 1840'
CERCLIS No.: LA0000605278
TDD No.: 06-04-03-0003

ATTACHMENT 4

Cactus Pipe Facility Site

Figure 3-3
Site Location


RESIDENCE
PASTURE
South Fieldspan Road (LA Hwy 724)
S1
S2
S3
S4
S5
S6
A1
A2
A3
A4
A5
A6
A7
A8
A9
P1
P2
NORTHERN PARCEL
SOUTHERN PARCEL
PASTURE
PASTURE
0 50 100 ft
Approximate Scale
AMERICAN WASTEWATER SYSTEMS
LEGEND
TREES
BUILDINGS
CONCRETE
SOIL PILE
DRAINAGE DITCH & FLOW DIRECTION
SITE ROADS (SHELL/GRAVEL)
A6 SITE AREA (NUMBER)
S4 SITE BUILDING (NUMBER)
FENCE
DRUM PILES
N
LOUISIANA
TDD NO.: 06-04-03-0003
CERCLIS NO.: LA0000605278
US EPA REGION 6
START-2
FIGURE 3-3
SITE SKETCH
CACTUS PIPE SITE
DUSON, LAFAYETTE PARISH, LOUISIANA
DATE: 9-23-04
W.O. # 12632.001.300.2138
APPROX. SCALE: AS SHOWN

ATTACHMENT 5

Cactus Pipe Facility Site

USGS Naturally Occurring Radioactive Materials (NORM)

USGS
science for a changing world

Naturally Occurring Radioactive Materials (NORM) in Produced Water and Oil-Field Equipment—An Issue for the Energy Industry

Introduction

Naturally occurring radioactive elements such as uranium, radium, and radon are dissolved in very low concentrations during normal reactions between water and rock or soil. Ground water that coexists with deposits of oil can have unusually high concentrations of dissolved constituents that build up during prolonged periods of water/rock contact. Many oil-field waters are particularly rich in chloride, and this enhances the solubility of other elements including the radioactive element radium. Some of this saline, radium-bearing water is unavoidably brought to the Earth's surface with the oil and must be separated and then disposed, usually by return to depth in an injection well. At some oil-field sites the pipes and tanks that handle large volumes of this "produced water" can become coated with scale deposits that contain radium. Radium-bearing scale is the type of "diffuse NORM waste" that occurs in the oil industry. Radium accumulation in oil-field equipment in the United States first became apparent in the 1980's when scrap metal dealers began to routinely detect unacceptable levels of radioactivity in shipments of oil-field pipe. Since that time the oil and gas industry has sought to better define the extent of the oil-field NORM problem, and to develop techniques for the prediction, prevention, remediation, and disposal of oil-field NORM. In parallel efforts, State and Federal regulatory agencies have worked to develop guidelines for the control of NORM that will adequately protect public health and the environment. This report summarizes current understanding of the composition and mode of occurrence of oil-field NORM in the United States, briefly reviews the status of NORM regulations, and identifies some health and environmental issues associated with oil-field NORM.

Location of Oil-Field NORM in the United States

Deposits of oil are found in 30 States, but the vast majority (86 percent) of onshore oil production is concentrated in Texas, Oklahoma, Louisiana, Wyoming, California, Kansas, and New Mexico (fig. 1*A*). In 1989 the American Petroleum Institute sponsored a preliminary nationwide reconnaissance of measurable radioactivity at the exterior surfaces of oil-field equipment (Otto, 1989). The results of this nonstatistical sampling indicated that gamma-ray radiation levels exceeded natural background radiation levels at 42 percent of the sites. Radiation levels greater than five times the median background of all sites were found at approximately 10 percent of the sites. Most of the sites with markedly higher radioactivity were concentrated in specific geographical areas, such as the Gulf Coast, northeast Texas, southeast Illinois, and south-central Kansas (fig. 1*B*). Additional surveys by some State agencies identified radioactive oil-field equipment in northern Michigan and eastern Kentucky. Pipe, casing, fittings, and tanks that have an extended history of contact with produced water are more likely to contain radioactive deposits than other parts of the plumbing system at oil-field production

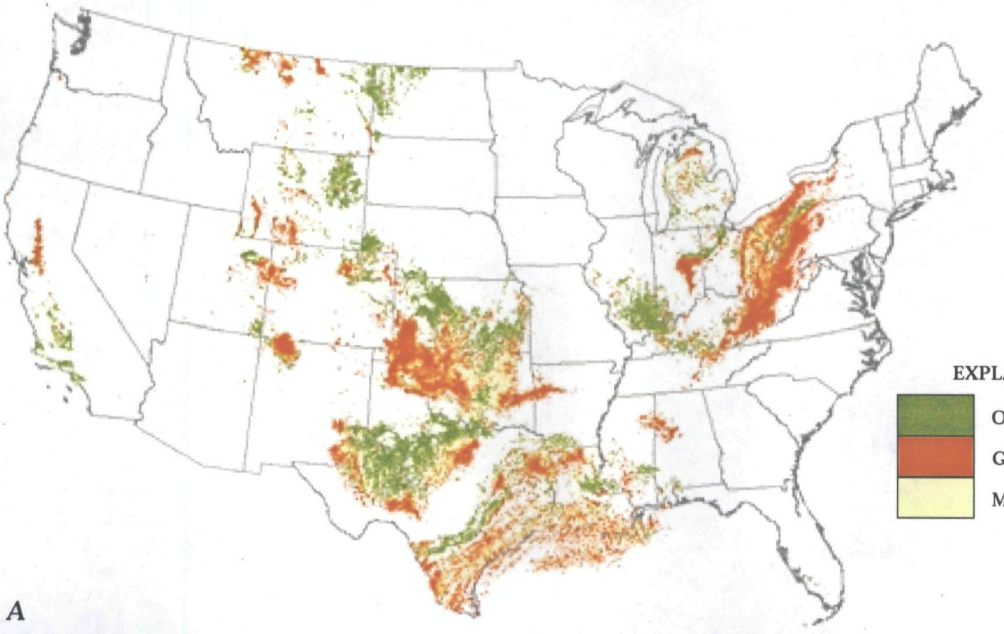
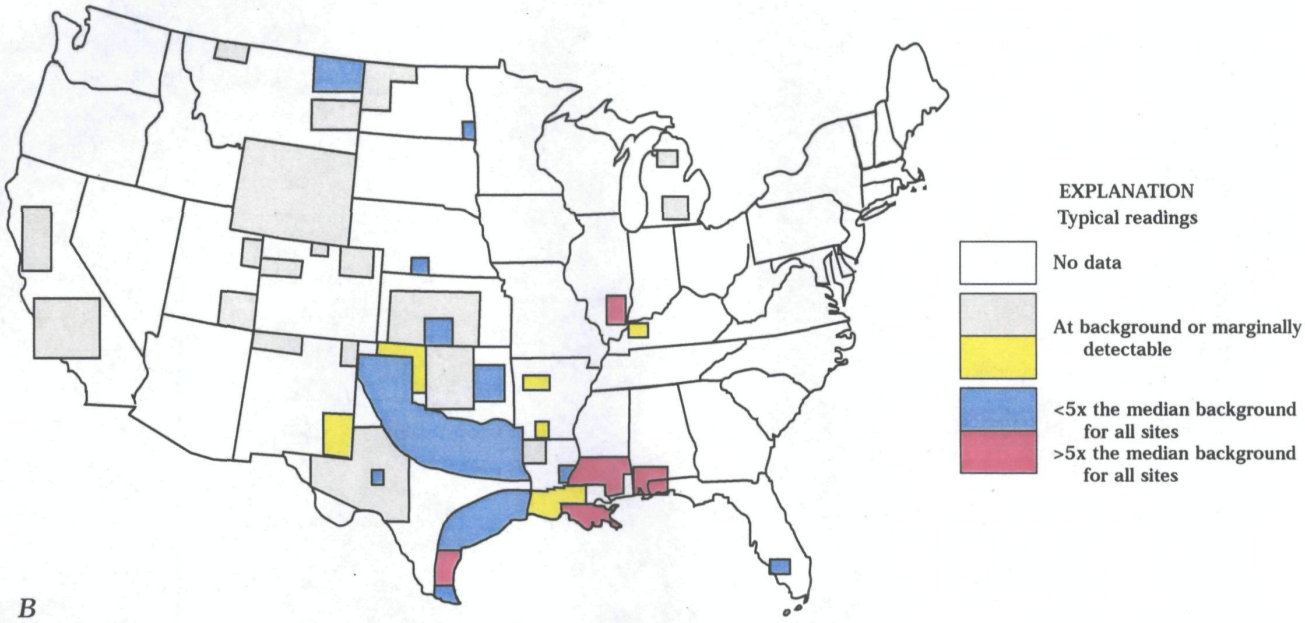


Figure 1 (left and next page). Areal distribution in conterminous United States of *A*, producing oil and gas wells through 1994, and *B*, radioactive oil-field equipment (next page). *A*, from Mast and others, 1998. *B*, modified from Otto, 1989. Reprinted courtesy of the American Petroleum Institute—based on original API figure, modified by U.S. Geological Survey.

U.S. Department of the Interior
U.S. Geological Survey

Printed on recycled paper

USGS Fact Sheet FS-142-99
September 1999



B

sites. Soil in the immediate vicinity of production sites may be unusually radioactive if affected by spills or leakage of produced water, or if contaminated by scale removed during pipe or tank cleaning operations. Handling of used pipe at pipe storage yards may also contaminate soil with radioactive scale. Although not discussed herein, some equipment used to process and transport natural gas may contain small amounts of radioactive decay products of radon gas.

Form of Oil-Field NORM

Oil-field equipment can contain radioactive scale and scale-bearing sludge, both of which form as coatings or sediments. The scale precipitates from produced water in response to changes in temperature, pressure, and salinity as the water is brought to the surface and is processed to separate coexisting crude oil. The scale is typically a mixture of carbonate and sulfate minerals. One of these sulfate minerals is barite (barium sulfate), which is known to readily incorporate radium (Ra) in its structure. Many studies of radioactive scale from oil-field equipment have documented that barite is the primary host of oil-field NORM and that the radioactivity is from isotopes of radium and their decay products. The two radium isotopes present in produced water and barite scale are ^{226}Ra (half-life =1,600 years) and ^{228}Ra (half-life =5.8 years). These two isotopes are produced by radioactive decay of uranium and thorium present in rocks of the oil-producing formations. The concentration of dissolved radium is therefore influenced by the abundance of uranium and thorium in reservoir rock and by the accessibility of water to the sites containing uranium and thorium. When radium is brought to the surface in produced water, the concentration of radium that is incorporated in barite scale is largely a function of (1) the concentration of dissolved radium and (2) the amount of produced water that moves past the site of barite precipitation.

Ongoing studies by USGS scientists are documenting variations in the mineralogy, chemistry, and radium concentration of in-place scale deposits. Better understanding of the specific location and texture of the most radioactive barite scale should contribute to more cost-effective strategies for its removal. Figure 2*A* illustrates some of the textural and mineralogical variability in a sample of scale from an old section of above-ground oil-field pipe. Lighter colored barite is present along with variable amounts of darker iron oxides. Barite occurs as intact layers as well as fragments of former layers that were transported and recemented with iron oxides. A corresponding image of radioactivity in this sample (fig. 2*B*) is recorded on a special film and illustrates the variable concentration of radium and its radioactive decay products in these layers.

Abundance of Radium in Oil-Field NORM

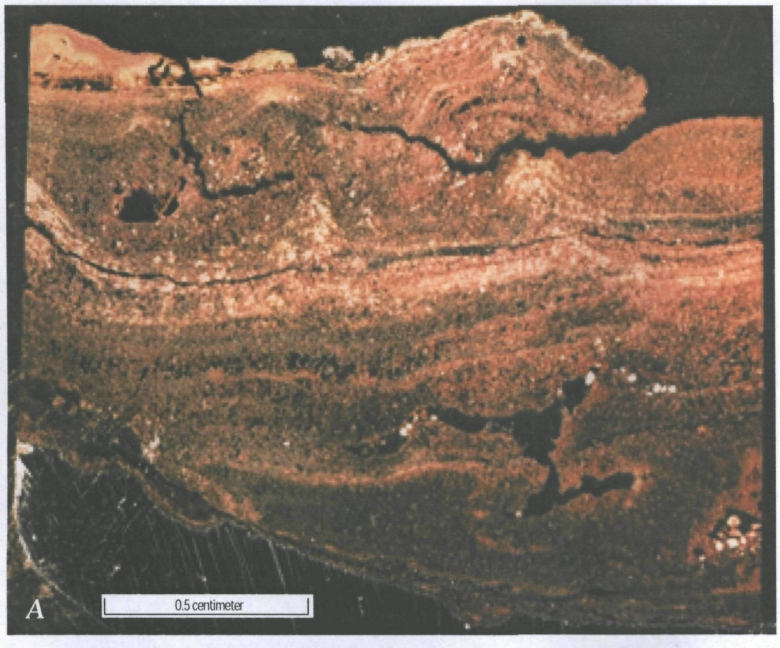
Measurement of total radioactivity with a hand-held radiation detection instrument permits rapid assessment of a site for NORM contamination, but site cleanup criteria and waste disposal options are based on actual concentrations of radium isotopes. Some specialized field instruments permit rapid estimates of the concentration of radium isotopes, but such estimates require confirmation by careful laboratory analysis of selected subsets of samples. Radium concentrations are generally reported as picocuries/gram (pCi/g) of solid material or picocuries/liter (pCi/L) of water or air. A picocurie equals 2.22 disintegrations-per-minute (dpm). Figure 3*A* illustrates the distribution of total radium concentration (^{226}Ra and ^{228}Ra) in barrels of oil-field NORM waste stored in Louisiana in 1992 (Wascom, 1994). The maximum radium concentration in this waste and in most reported oil-field scale from the U.S. is several thousand pCi/g, although very small quantities of scale have been reported with as much as 400,000 pCi/g of radium. For comparison, most natural soils and rocks contain approximately 0.5–5 pCi/g of total radium. A uranium ore sample containing 1 weight percent uranium has approximately 3,300 pCi/g of ^{226}Ra. Most of the radium in older oil-field scale is ^{226}Ra, because the shorter lived ^{228}Ra decays with a half-life of 5.8 years.

Figure 3*B* illustrates the distribution of dissolved ^{226}Ra concentration in 215 samples of produced water from seven major oil-producing areas (Fisher, 1998). Radium tends to be more

abundant in the more saline and chloride-rich varieties of these produced waters. The maximum concentration of dissolved ^{226}Ra in this limited data set is several thousand pCi/L, but concentrations above 10,000 pCi/L have been reported in the U.S. Produced water also contains dissolved ^{228}Ra, which is typically one-half to twice the concentration of ^{226}Ra. For comparison, the U.S. EPA maximum contaminant level for drinking water is 5 pCi/L for total dissolved radium.

Regulations for the Control of Oil-Field NORM

There currently exist no Federal regulations that specifically address the handling and disposal of oil-field NORM wastes. States that have enacted specific NORM regulations include some important oil producers such as Texas, Louisiana, New Mexico, and Mississippi. New NORM regulations or modifications to general radiation protection statutes are under consideration in other major oil-producing States such as California, Kansas, and Oklahoma. Standards for cleanup of radium-contaminated soils that typically appear in enacted or proposed NORM regulations call for an average concentration of less than 5 pCi/g in the upper 15 cm (centimeters) of soil and an average of less than 15 pCi/g in deeper increments of 15 cm. Some States allow an average of as much as 30 pCi/g of radium in the upper 15 cm of soil. For oil-field equipment, typical standards for release for other uses or for recycling require that radioactivity at the surface should not exceed some low multiple of natural background radioactivity.



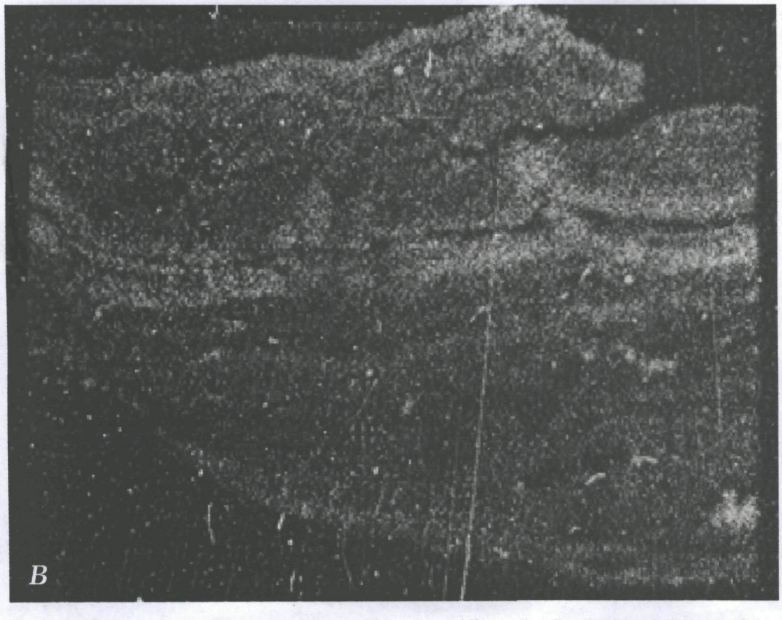


Figure 2. Radioactive scale deposits inside oil-field pipe (*A*) and the distribution of alpha-particle-emitting radium and radium decay products in the same sample (*B*). Brighter regions on the alpha emission image indicate areas of scale with higher concentrations of radioactive elements.

Health and Environmental Issues of Oil-Field NORM

Once formed, barite is a very insoluble mineral. One liter of water at the Earth's surface dissolves only 0.0025 grams of barite. Efficient removal of barite deposits from oil-field equipment requires special chemicals or vigorous mechanical methods. The process of barite removal and disposal is complicated by the need to minimize radiation dose to workers and the general public. Radiation exposure pathways include external gamma radiation (major), ingestion (minor), and inhalation of particulates and radon gas (major).

Figure 4 illustrates the relative isolation of NORM waste from the general public for a variety of possible disposal options. As degree of isolation increases so does the capability for disposing of higher radium concentrations. Currently most oil-field NORM waste is stored at production sites awaiting disposal in specially designated and permitted landfills, disposal wells, or injection wells (fig. 4). Surface spreading and dilution of low-level NORM waste (fig. 4) is a past practice that is now disallowed by most States with NORM regulations. A preliminary radiological dose assessment was reported for a scenario in which individuals live on a NORM-amended soil and consume local water, livestock, and food crops (Smith and others, 1996). For soils amended with radium to the highest concentration under regulatory consideration (30 pCi/g) the additional annual radiation dose by all pathways was equivalent to the average annual background dose to the U.S. population. Current limits set by the Nuclear Regulatory Commission require that the total of such additional doses to the general public be limited to about 30 percent of the average annual background dose.

Prior to 1970 the regulations governing disposal of produced water and scale were less restrictive, and thus older oil-field production sites are more likely to have above-background concentrations of NORM in nearby soils and stream sediments. Several studies, including some by USGS researchers, have documented the presence of barite in soils contaminated with oil-field NORM.

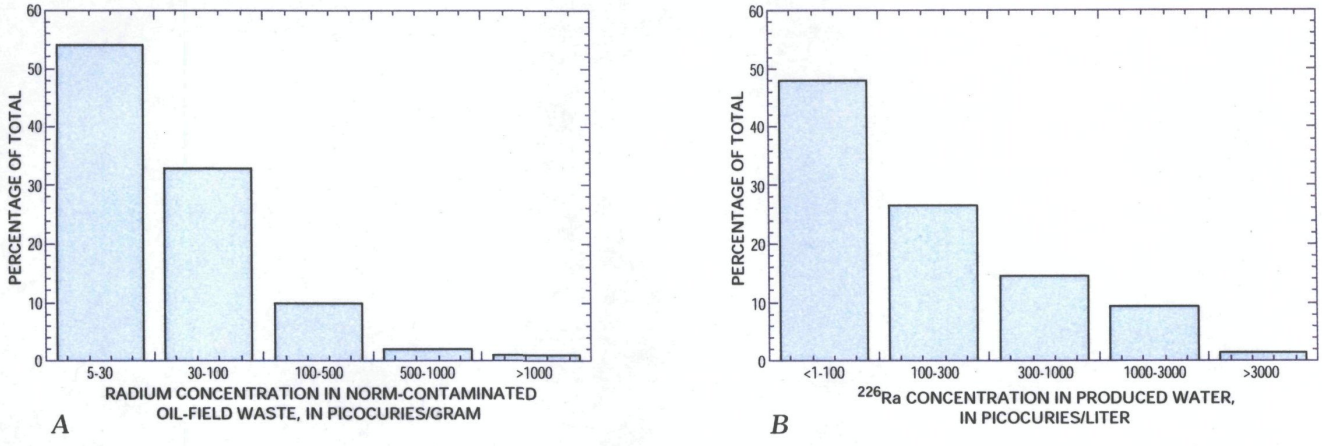


Figure 3. Estimated distribution of radium concentration in *A*, solid oil-field waste and *B*, produced water.

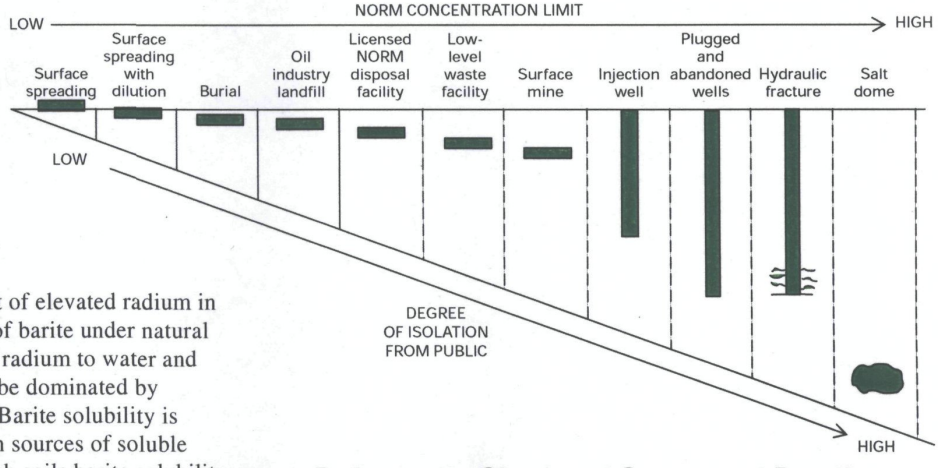


Figure 4. Disposal alternatives for NORM wastes. Disposal of more concentrated wastes requires greater isolation of waste from the general public. Modified from American Petroleum Institute (1992). Reprinted courtesy of the American Petroleum Institute- based on original API figure, modified by U.S. Geological Survey.

Barite scale is the most likely host of elevated radium in these soils. The extreme insolubility of barite under natural conditions limits the rate of release of radium to water and suggests that dispersal of radium will be dominated by physical transport of barite particles. Barite solubility is lowest in oxidized soils that are rich in sources of soluble sulfate such as gypsum. In organic-rich soils barite solubility is increased by the action of sulfate-consuming bacteria. The average age of formation of barite scale can be estimated based on the different rates of decay of ^{226}Ra and ^{228}Ra, or based on the buildup of radioactive decay products of these radium isotopes. Such information is useful for determining the sources and history of contamination at a site and for assigning possible liability.

Current Status and Future Direction of the Oil-Field NORM Issue

The magnitude of the oil-field NORM problem in the U.S. has been estimated, but it remains to be completely assessed. Increased industry awareness and understanding of the problem coupled with government regulatory efforts have provided much better control of oil-field NORM wastes and have reduced the radiation exposure to workers and the public. Management of the present inventory of stored oil-field NORM waste and options for its disposal are designed to reduce radiation hazard to the general public. The challenge to the oil and gas industry will be to develop safer and more cost-effective methods to minimize, process, and dispose of future oil-field NORM. An additional challenge to industry and government is to identify, remediate, and if necessary, remove NORM contamination that remains at old or abandoned petroleum production sites.

References Cited and Suggested Reading

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Smith, K.P., Blunt, D.L., Williams, G.P., and Tebes, C.L., 1996, Radiological dose assessment related to management of naturally occurring radioactive materials generated by the petroleum industry: Argonne, Ill., Argonne National Laboratory, Publication ANL/EAD-2, 65 p.

Wascom, C.D., 1994, NORM disposal options in the State of Louisiana: Proceedings of the 1994 Rocky Mountain Symposium on Environmental Issues in Oil and Gas Operations, Colorado School of Mines, Golden, Colo., 10 p.

For More Information Contact

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(303) 236-8020
e-mail: jkotton@usgs.gov

ATTACHMENT 6

Cactus Pipe Facility Site

Site Photographs

Cactus Pipe
Duson, Lafayette Parish Louisiana

Soil Pile Number Two

Southwest Area of Site, West of Central Drainage Ditch

Tubing Cleaning/Inspection Area (S1)

Drum Pile